Ecosystem-based adaptation options for smallholder coffee farmers in Central America and pastoralists in South Africa

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Ecosystem-based adaptation (EbA) and Smallholder farmers

EbA could be a promising approach for smallholder farmers:

- Help farmers adapt to climate change
- Maintain or improve ecosystem function and key services
- Provide co-benefits that can improve farmer livelihoods

However, limited information is available on:

- Which EbA options are feasible in different socio-ecological contexts
- What the opportunities and constraints are for their broad scale use

Objectives

- Highlight examples from projects led by Conservation International that aim to help smallholder farmers and pastoralists adapt to climate change by using EbA practices

- Identify key opportunities and constraints to scale up the use of EbA for smallholder farmers and pastoralists

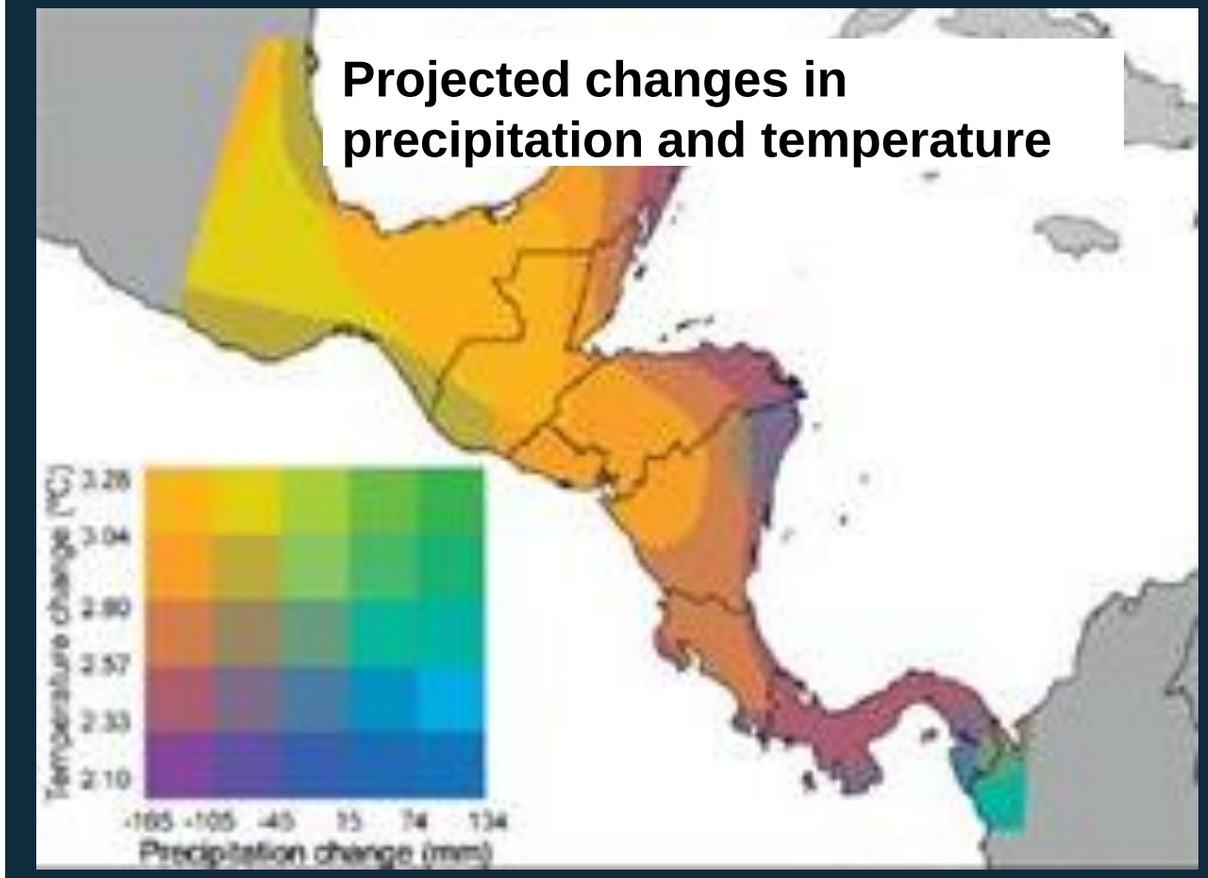
1. *CASCADE* project: to help vulnerable smallholder farmers adapt to climate change by identifying and testing Ecosystem-based Adaptation and building local capacity to support the implementation EbA strategies in smallholder farming communities in Central America.

Research

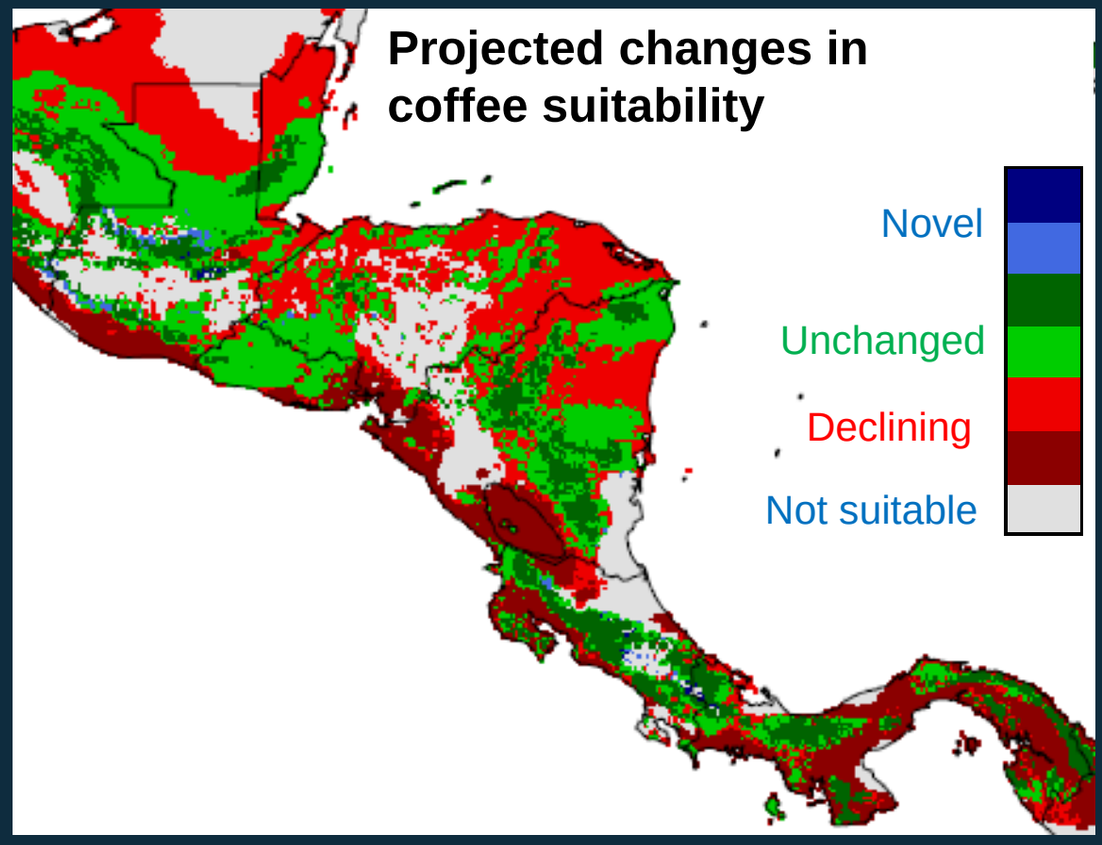
Capacity building

Policy work

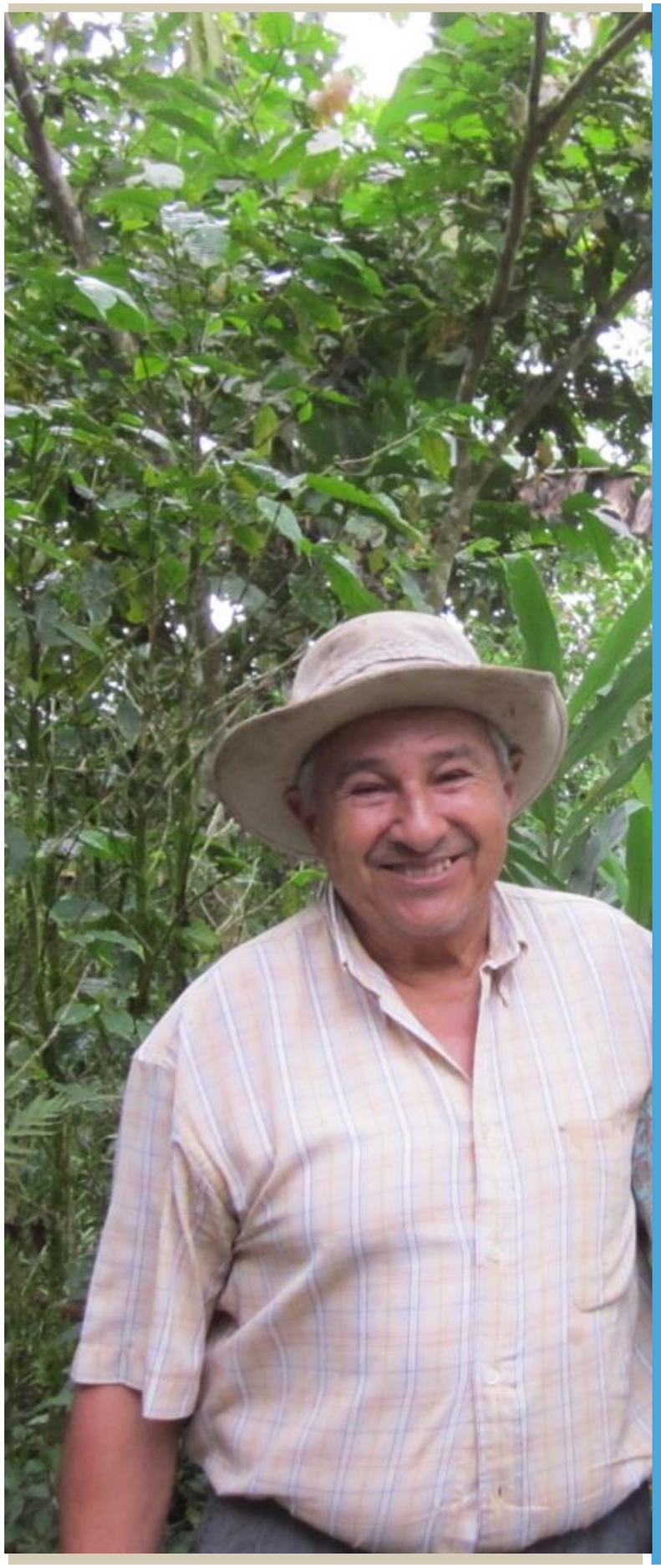
Study region: Central America (Guatemala, Costa Rica, Honduras)



Source: Imbach et al. 2012



Source: Conservation International



How is climate change affecting smallholder farmers?

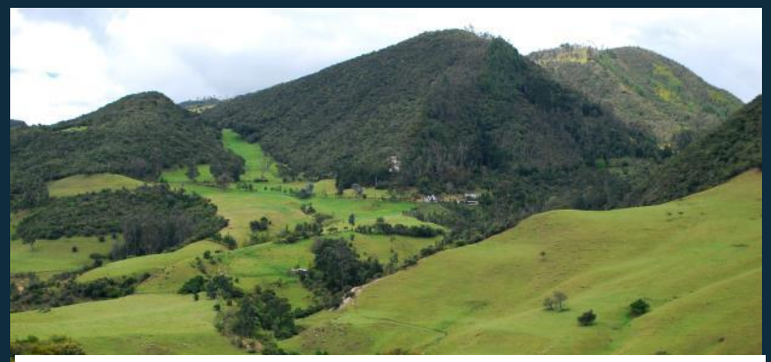
Among smallholder coffee farmers in Turrialba, Costa Rica (n=150):

- 98% reported changes in climate over last 10 years
  - Higher temperatures
  - Less precipitation per year
  - Rains concentrated in short periods of time
  - Beginning of the rainy season is now unpredictable
- 94% have experienced declines in coffee yields in the last 10 years
- 94% reported increased damage due to pests and diseases (particularly coffee leaf rust disease) in the last 10 years
- 40% have made changes in their farming practices to adapt to those impacts

Practices that smallholder coffee farmers are using to adapt to climate change

Shaded coffee

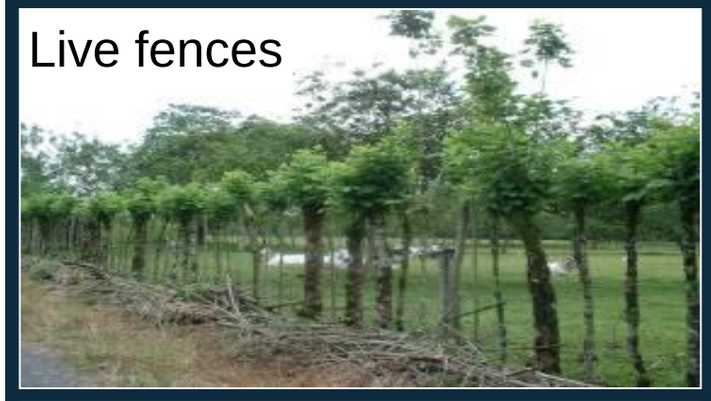
Farm diversification



Reforestation and forest conservation

Terraces

Live fences



Tolerant varieties

Use of fertilizers

Cover crops

Many of these practices are EbA

Shaded coffee

96%

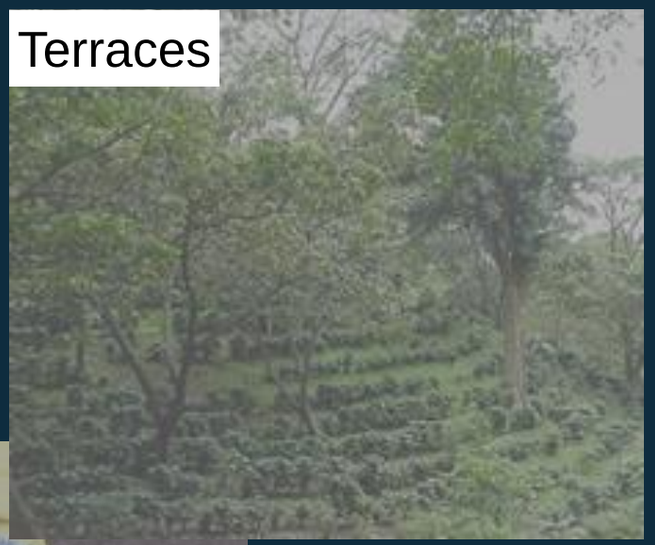
Farm diversification

70%

30%

Reforestation and forest conservation

Terraces



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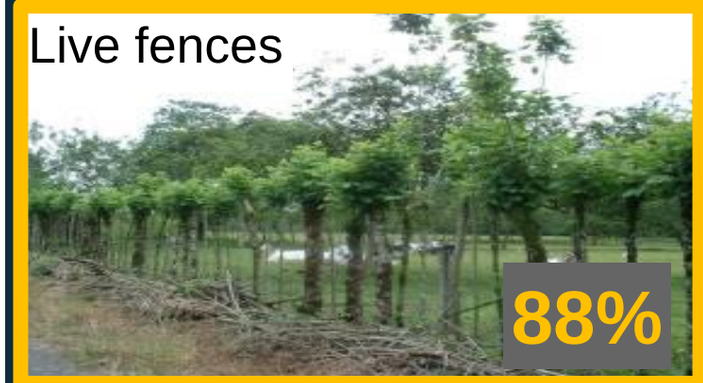


88%

Tolerant varieties

Use of fertilizers

Cover crops

40%

EbA practices provide other benefits and co-benefits

Shaded coffee (agroforestry system)

Adaptation benefits:
-Buffers extreme temperature and radiation
-Buffers impact of heavy rains
-Increases water infiltration and retention
-Regulates humidity

Other co-benefits:

Provide other products (firewood, timber, fruits)

Maintain ecosystem services

Provide habitat for wildlife

Attract polinators

Opportunities and constraints for EbA in Central America

Opportunities:

- Farmers are aware of climate change and the need to adapt
- Many farmers already use some EbA practices and have local knowledge on these practices
- Farmers are aware of the multiple benefits of EbA practices

Constraints:

- Lack of extension services and technical support for farmers
- Lack of incentives or programs to help cover costs of adaptation for smallholder farmers
- EbA not explicitly included in national agriculture or adaptation policies

2. *Adaptation solutions* project: To carry out Ecosystem-based Adaptation in marine, terrestrial and coastal regions as a means of improving livelihoods and conserving biodiversity in the face of climate change

Research

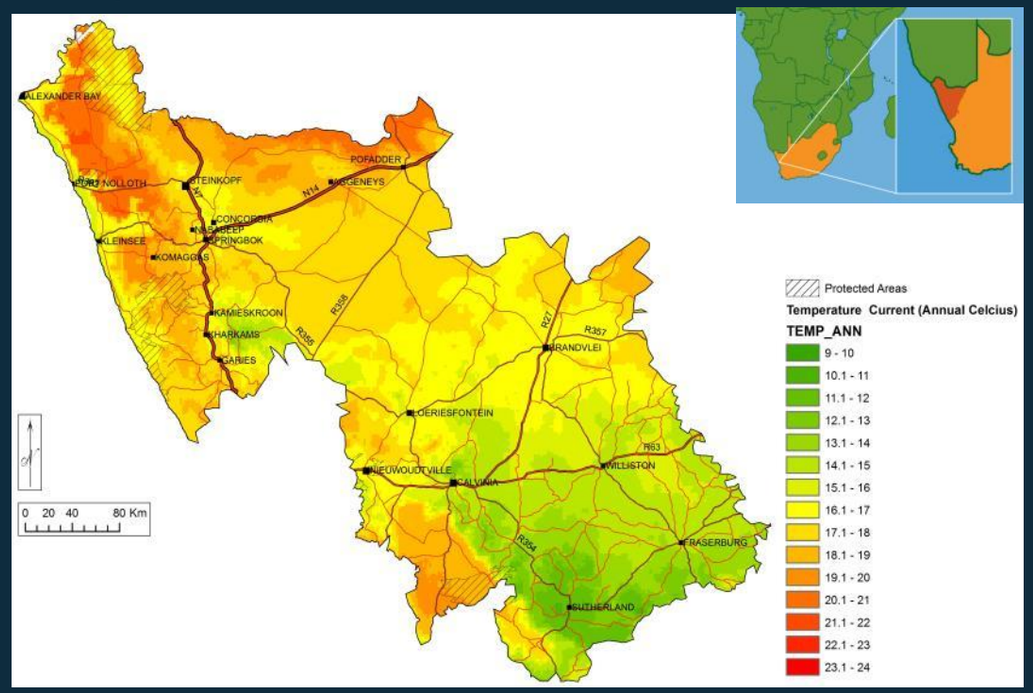
EbA implementation

Poliicy work

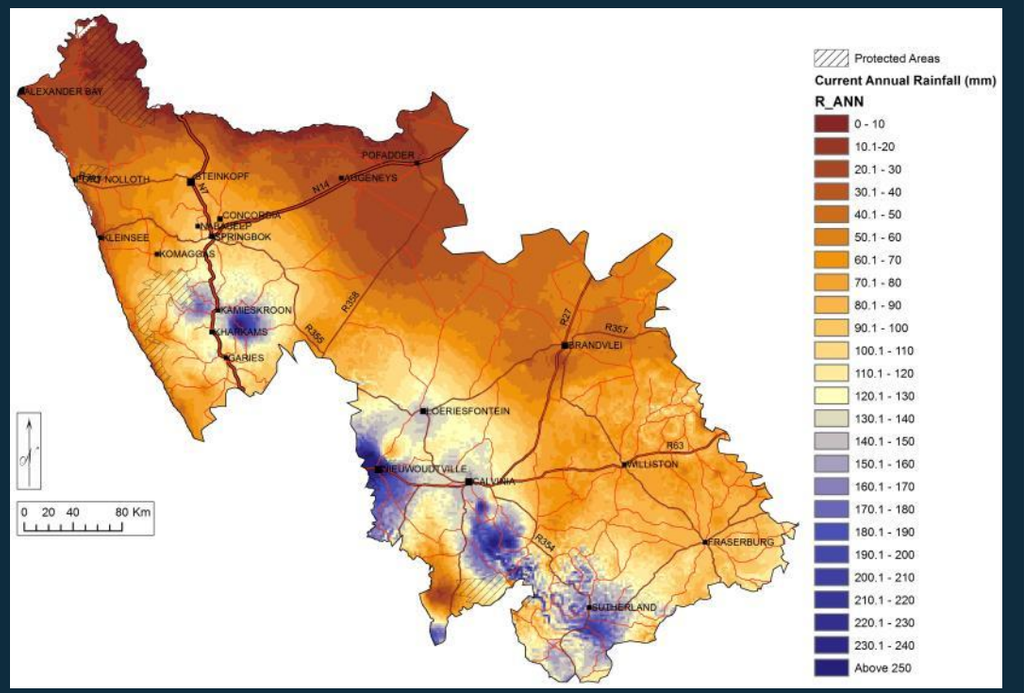
Study region: Namaqualand region, South Africa

Current conditions

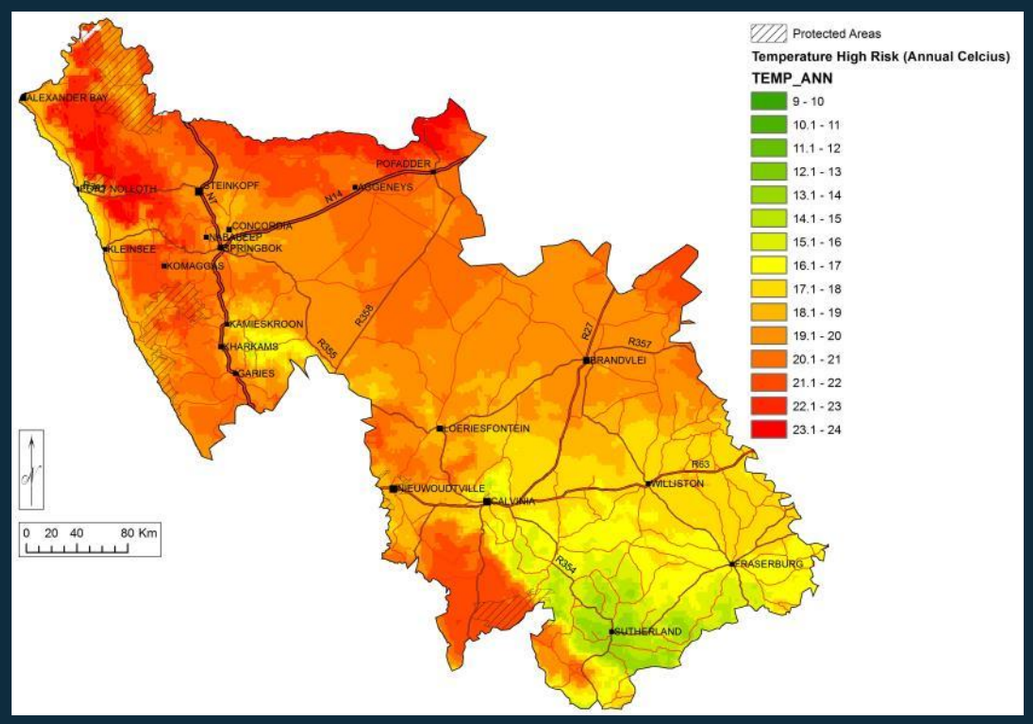
Temperature

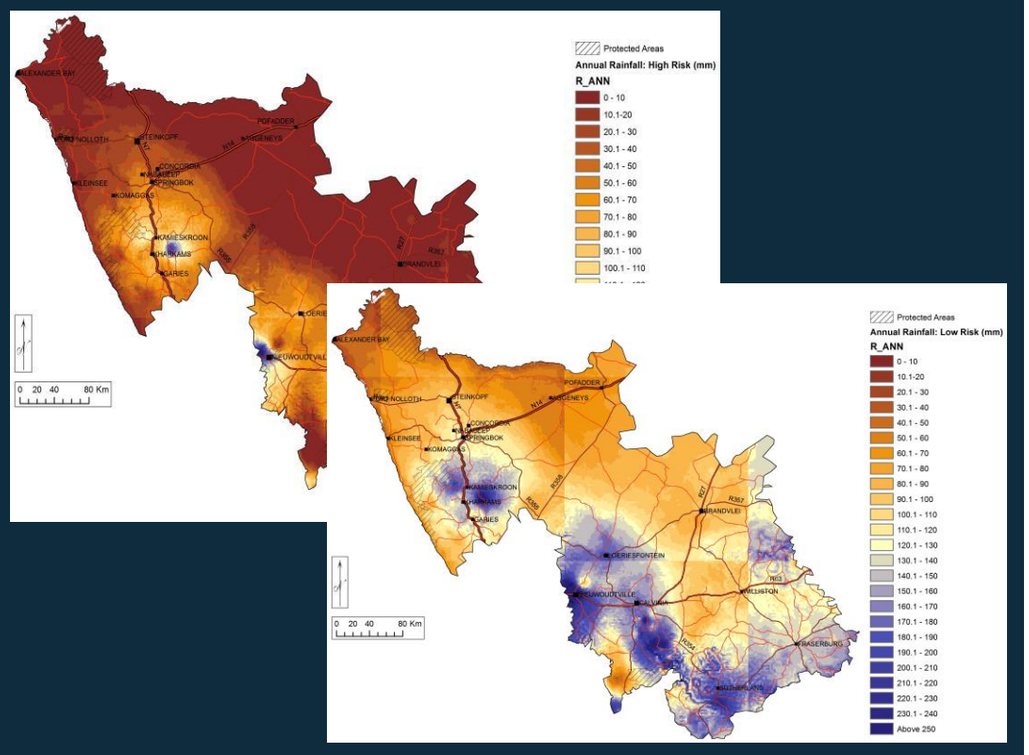


Precipitation



Projected conditions





Source: Bourne et al. 2012

Context

- Communal farming (sheep/goats) is an important livelihood

- Pastoralists rely strongly on ecosystem services, especially on wetlands as a source of water and food for livestock

- Higher temperatures→ more aridity → less fodder → lower animal productivity

- In this socio-ecological context, EbA is a promising option to help pastoralists adapt to climate change

EbA practice: wetland restoration

Activities

- Removal of alien plants
- Re-vegetation
- Installation of structures to prevent erosion

GOAL: Maintain livestock productivity under climate change by ensuring the provision of water and fodder for livestock

Opportunities and constraints for EbA in South Africa

Opportunities:

• Wetland restoration is very effective at quickly increasing fodder and water availability for livestock

•Local communities can be involved in wetland rehabilitation, increasing their income

•The presence of a government program- Working for Wetlands- that promotes wetland rehabilitation

Constraints:

• High cost of implementation

Wetland rehabilitation is 2-10 X higher than alternative approaches- such as borehole drilling or bringing in fodder for elsewhere

Take home messages

- There is wide scope for EbA to help smallholder farmers and pastoralists adapt to climate change, while providing additional benefits
- Many EbA practices are already well-known, but more information is needed on their long-term effectiveness, and relative costs and benefits.
- Adoption of EbA could be promoted through increased extension/training, more supportive policy frameworks and increased funding
- EbA is an important part of the adaptation package we need to promote with smallholder farmers and pastoralists

Thank you!

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For more information on these projects:
www.conservation.org/cascade
www.conservation.org/ebasolutions
Or contact Camilla Donatti (cdonatti@conservation.org)